

What is claimed is:

1. An ice supply system of a refrigerator, comprising:

an icemaker for producing ice using cool air of the freezer;

a container provided at a door enabling to be inserted into or withdrawn from the door

100 by being slid when the door is closed, the container comprising:

an open top;

a first opening provided at a side;

a transfer device rotating and transferring ice to the first opening; and

an outlet for discharging ice.;

a crusher for crushing ice transferred by the transfer device; and

an ice discharger fixed at the door for controlling an opening and closing amount of the outlet being communicated with an ice chute provided at the door.

2. The ice supply system of the refrigerator of claim 1, wherein the icemaker is provided at the door.

3. The ice supply system of the refrigerator of claim 1, wherein the icemaker is provided in the freezer.

4. The ice supply system of the refrigerator of claim 1, further comprising a guide provided at the door for guiding a movement of the container so as to slide the container into the door smoothly.

5. The ice supply system of the refrigerator of claim 1, wherein the crusher formed as a one piece provided at the door.

6. The ice supply system of the refrigerator of claim 5, wherein the crusher comprises:
a housing provided at the door and having a second opening provided at a side thereof to face the first opening;

a crushing member provided in the housing, coupled with the transfer device when the container is inserted into the door, and crushing ice using at least one rotary blade; and

a motor provided at the door and pivotely coupled with the crushing member.

7. The ice supply system of the refrigerator of claim 6, wherein the crushing member comprises:

a shaft coupled with the motor, and rotated and pivotally coupled with the transfer device when the container is inserted into the door;

a supporter provided in the housing for supporting the shaft, through which the shaft rotatably passes; and

at least one blade coupled with the shaft for crushing the ice transferred into the housing.

8. The ice supply system of the refrigerator of claim 7, wherein the shaft comprises a groove and the transfer device comprises a projection inserted into the groove.

9. The ice supply system of the refrigerator of claim 1, wherein the ice discharger comprises:

an actuator operated in accordance with a signal of a controlling member; and

a shutter moved by the actuator for controlling the opening and closing amount of the outlet.

10. The ice supply system of the refrigerator of claim 9, wherein the ice discharger discharges ice crushed by the crusher to the ice shutter when the shutter slightly opens the outlet and directly discharges ice stored in the container when the shutter completely opens the outlet.

11. The ice supply system of the refrigerator of claim 1, wherein the crusher is provided at the door and the container and formed as two pieces pivotely coupled with each other.

12. The ice supply system of the refrigerator of claim 11, wherein the crusher comprises:

- a first housing provided in the door and having a second opening provided at a side to face the first opening;
- a crushing member provided in the housing and crushing ice using at least one rotary blade;
- a second housing provided adjacent to the first opening in the container;
- a second crushing member provided in the second housing for being pivotely coupled with the transfer device, pivotely coupled with the first crushing member when the container is inserted into the door, and crushing ice using at least one rotary blade; and
- a motor provided at the door and pivotely coupled with the first crushing member.

13. The ice supply system of the refrigerator of claim 12, wherein each of the first and second crushing members comprises:

- a shaft pivotely coupled and rotated together with the motor or the transfer device;

a supporter provided to support the shaft in each of the first and second housings through which the shaft rotatably passes; and

at least one blade coupled with the shaft and rotated for crushing the ice transferred into the first and second housing.

14. The ice supply system of the refrigerator of claim 13, wherein the shaft of the first crushing member comprises a groove provided at a side thereof and the shaft of the second crushing member comprises a projection inserted into the groove.